

REMARKS

In an Office Action mailed June 1, 2006, the Examiner rejected claims 1-5, 7-26, and 27-38 as follows:

1. Claim 22 was rejected under 35 U.S.C. 112, second paragraph;
2. Claims 1-3 and 16-18 were rejected under 35 U.S.C. 102(e) over U.S. Publ. No. 2004/0052300 ("Lopez-Estrada");
3. Claims 4-5, 7-9, and 19-20 were rejected under 35 U.S.C. 103(a) over Lopez-Estrada in view of U.S. Publ. No. 2003/0052300 ("Yang");
4. Claims 10-15 were rejected under 35 U.S.C. 103(a) over Yang in view of Lopez-Estrada;
5. Claims 21-24 and 31-32 were rejected under 35 U.S.C. 103(a) over U.S. Pat. No. 6,049,573 ("Song") in view of Lopez-Estrada;
6. Claims 25-26 and 28-30 were rejected under 35 U.S.C. 103(a) over Song in view of Lopez-Estrada, and in further view of Yang; and
7. Claims 33-38 were rejected under 35 U.S.C. 103(a) over U.S. Publ. No. 2003/0071925 ("Kanno") in view of Lopez-Estrada;

Allowable Subject Matter

Claims 6 and 27 were objected to as being dependent upon a rejected base claim but would be allowable if rewritten in independent form.

112 Rejection

1. Claim 22 was rejected under 35 U.S.C. 112, second paragraph, for lacking antecedent basis for the phrase "the image reject mixer" in line 1 thereof. Applicant has amended claim 22 to properly depend on claim 21 instead of claim 12.

102 Rejection

2. Claims 1-3 and 16-18 were rejected under 35 U.S.C. 102(e) over U.S. Publ. No. 2004/0052300 ("Lopez-Estrada"). Applicant notes that Lopez-Estrada does not disclose a polyphase filter formed by two successively connected polyphase filter sections, along with a buffer interposed between the two polyphase filter sections for buffering the output of the first polyphase filter section. Lopez-Estrada does not disclose or suggest that filter 1020 is a polyphase filter at all. Note the correspondence between up-converter 1010 in FIG. 10 and upconverter 110 in FIG. 1, as well as filter 1020 in FIG. 10 and lowpass filter 120 in FIG. 1. Apparently, Lopez-Estrada performs the first up conversion step using conventional digital lowpass filtering. Note that filter 1020 provides a single output representing only a single phase at the higher sampling rate to the input of PCM buffer 1030.

Thus, Lopez-Estrada fails to show or suggest a polyphase filter comprising first and second filter sections, in which the first filter section has "an output for providing signals representative of at least two phases of a filtered signal" to a buffer as recited in claim 1. Lopez-Estrada also does not show or suggest "filtering said signals successively in a polyphase filter having first and second polyphase filter sections . . . wherein said step of filtering comprises buffering said output of said first polyphase filter section to provide said input of said second polyphase filter section" as recited in claim 16.

Claims 2-3 and 17 are allowable for at least the reasons that base claims 1 and 16 are allowable.

Withdrawal of the rejections under 35 U.S.C. 102(e) is respectfully requested.

103 Rejections

3. Claims 4-5, 7-9, and 19-20 were rejected under 35 U.S.C. 103(a) over Lopez-Estrada in view of U.S. Publ. No. 2003/0052300 ("Yang"). Note that Yang discloses a polyphase filter series 404 in FIG. 4 thereof having multiple stages 406, 408, and 410 that are connected in a series fashion. Likewise, Yang discloses alternate connections between the inputs and outputs of the polyphase filters in FIGs. 9 and 11 thereof. However Yang's polyphase filter is a unitary, multi-stage polyphase filter because Yang does not disclose or in any way suggest a buffer

between any of the polyphase filter sections. Thus the combination of Lopez-Estrada in view of Yang, even if it were obvious to combine them in the manner proposed by the Examiner, still fails to disclose or suggest all the elements of base claims 1 and 16, and claims 4-5, 7-9, and 19-20 are allowable thereover for at least the same reasons that there underlying base claims are.

4. Claims 10-15 were rejected under 35 U.S.C. 103(a) over Yang in view of Lopez-Estrada. However as noted above, Yang discloses a unitary, multi-stage polyphase filter with no buffering between the stages. Lopez- Estrada discloses an interpolator comprising an upconverter 1010 and a conventional digital lowpass filter 1020, whose output is buffered before being input to a polyphase filter. The combination fails to show or suggest a buffer between polyphase filter sections. Thus, the combination fails to show or suggest “wherein one of said at least three polyphase filter stages is coupled to another one of said at least three polyphase filter stages by means of a buffer” as recited in claim 10. Moreover such would not be obvious to one of ordinary skill in the art because the primary reference Yang in fact teaches away from this limitation by connecting three polyphase filter stages, e.g. 406, 408, 410 in FIG. 4, in series without buffering.

5. Claims 21-24 and 31-32 were rejected under 35 U.S.C. 103(a) over U.S. Pat. No. 6,049,573 (“Song”) in view of Lopez-Estrada. The Examiner finds the first and second mixers in Song’s tuner architecture disclosed in FIG. 3 thereof, and argues that it would have been obvious to incorporate the polyphase filter of Lopez-Estrada into the tuner of Song. However Lopez-Estrada was directed to the problem of sample rate conversion rather than tuning, and thus it would not have been obvious to substitute the polyphase filter of Lopez-Estrada into the tuner of Song. Thus Applicant disagrees that it would be obvious to combine the teachings of Song and Lopez-Estrada in the manner suggested by the Examiner.

Moreover, Lopez-Estrada fails to disclose or suggest a polyphase filter with first and second polyphase filter sections with an intervening buffer section. Thus even if it were obvious to combine Song and Lopez-Estrada in the manner suggested by the Examiner, the combination

still fails to show or suggest “a polyphase filter . . . comprising: a first polyphase filter section having . . . outputs for providing signals representative of at least two phases of a filtered signal” and “a buffer section having an input coupled to an output of said first polyphase filter section” as recited in claim 21.

Claims 22-24 and 31-32 are allowable for at least the reasons that base claim 21 is allowable.

6. Claims 25-26 and 28-30 were rejected under 35 U.S.C. 103(a) over Song in view of Lopez-Estrada, and in further view of Yang. Applicants note that Yang fails to disclose or suggest the features of base claim 21 that were missing from the combination of Song and Lopez-Estrada, as further described in paragraph 2 above. Thus claims 25-26 and 28-30 are allowable over the combination of Song, Lopez-Estrada, and Yang for at least the same reasons that claim 21 is allowable thereover.

7. Claims 33-38 were rejected under 35 U.S.C. 103(a) over U.S. Publ. No. 2003/0071925 (“Kanno”) in view of Lopez-Estrada. The Examiner finds the first and second mixers and first and second filters in Kanno’s receiver disclosed in FIGs. 5, 7, and 12 thereof, and argues that it would have been obvious to incorporate the polyphase filter of Lopez-Estrada into the receiver of Kanno. However Lopez-Estrada was directed to the problem of sample rate conversion rather than tuning, and thus it would not have been obvious to substitute the polyphase filter of Lopez-Estrada into the receiver of Kanno. Thus Applicant disagrees that it would be obvious to combine the teachings of Kanno and Lopez-Estrada in the manner suggested by the Examiner.

Moreover, Lopez-Estrada fails to disclose or suggest a polyphase filter with first and second polyphase filter sections with an intervening buffer section. Thus even if it were obvious to combine Song and Lopez-Estrada in the manner suggested by the Examiner, the combination still fails to show or suggest “a polyphase filter . . . comprising: a first polyphase filter section having . . . outputs for providing signals representative of at least two phases of a filtered signal” and “a buffer section having an input coupled to an output of said first polyphase filter section”

as recited in claim 33.

Claims 34-38 are allowable for at least the reasons that base claim 33 is allowable.

Withdrawal of all the rejections under 35 U.S.C. 103(a) is respectfully requested.

CONCLUSION

Applicant respectfully submits that all pending claims are allowable over the prior art of record for the reasons more particularly set forth above. Applicant respectfully requests the reconsideration of the rejection of the pending claims and the allowance thereof, thereby placing the application in condition for allowance. If the Examiner is unable to issue a Notice of Allowance at the next communication and believes that a telephone interview would be appropriate, Applicant respectfully requests the Examiner to contact the undersigned attorney at the phone number listed below.

Respectfully submitted,

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Date

Paul J. Polansky
Paul J. Polansky; Reg. No. 33,992
Attorney for Applicant(s)
LARSON NEWMAN ABEL POLANSKY & WHITE, LLP
5914 West Courtyard Drive, Ste. 200
Austin, Texas 78730
(512) 439-7100 (phone)
(512) 439-7199 (fax)